

How to plot time-series for multiple data variables with **Giovanni-4**

The following slides demonstrate how to plot time-series
with multiple data variables at the same time with
Giovanni-4

This is a demonstration of how to plot time-series of more than one data variable at the same time with Giovanni-4.

Giovanni The Bridge Between Data and Visualization [Compatibility](#) [Known Issues](#)

Error in the content of AOD dust 550 nm GOCART model data prior to Jun [1 of 1 messages] [Read More](#)

Select Plot

☐ Maps: Select... ☐ Comparisons: Select... ☒ Time Series: Area-Averaged ☐ Vertical: Select... ☐ Miscellaneous: Select...

Select Date Range (UTC)

YYYY-MM-DD
2010 -07 -01 00 hrs to 2010 -08 -31 23 hrs
Valid Range: 2002-08-31 to 2014-12-10

Select Region (Bounding Box or Shapefile)

Format: West, South, East, North
35.7275, 51.8276, 40.8691, 58.0239 [Show Map](#) [Show Shapes](#)

Select Variables

▼ Disciplines

- ☐ Aerosols (124)
- ☐ Atmospheric Chemistry (12)
- ☐ Atmospheric Dynamics (62)
- ☐ Hydrology (30)
- ☐ Water and Energy Cycle (42)

▼ Measurements

- ☐ Aerosol Index (1)
- ☐ Air Pressure (5)
- ☐ Air Temperature (14)
- ☐ Albedo (5)
- ☐ Altitude (4)
- ☐ Angstrom Exponent (16)
- ☐ Atmospheric Moisture (21)
- ☐ CH4 (4)
- ☐ CO (4)
- ☐ Cloud Fraction (4)

Number of matching Variables: 0 of 239

Keyword: [Search](#) [Clear](#)

	Variable Name	Source	Temp. Res.	Spat. Res.	Begin Date	End Date
<input checked="" type="checkbox"/>	Aerosol Optical Depth 550 nm (Dark Target) (MOD08_D3 v051)	MODIS-Terra	Daily	1°	2000-03-01	2014-12-10
<input checked="" type="checkbox"/>	Aerosol Optical Depth 550 nm (Dark Target) (MYD08_D3 v051)	MODIS-Aqua	Daily	1°	2002-07-04	2014-12-15
<input checked="" type="checkbox"/>	Ozone Total Column (Daytime/Ascending) (AIRX3STD v006)	AIRS	Daily	1°	2002-08-31	2014-12-16
<input checked="" type="checkbox"/>	Ozone Total Column (Nighttime/Descending) (AIRX3STD v006)	AIRS	Daily	1°	2002-08-31	2014-12-16

The variables selected are daily MODIS aerosol optical depth and daily AIRS total column ozone

[Help](#) [Reset](#) [Feedback](#) [Plot Data](#) [Go to Results](#)

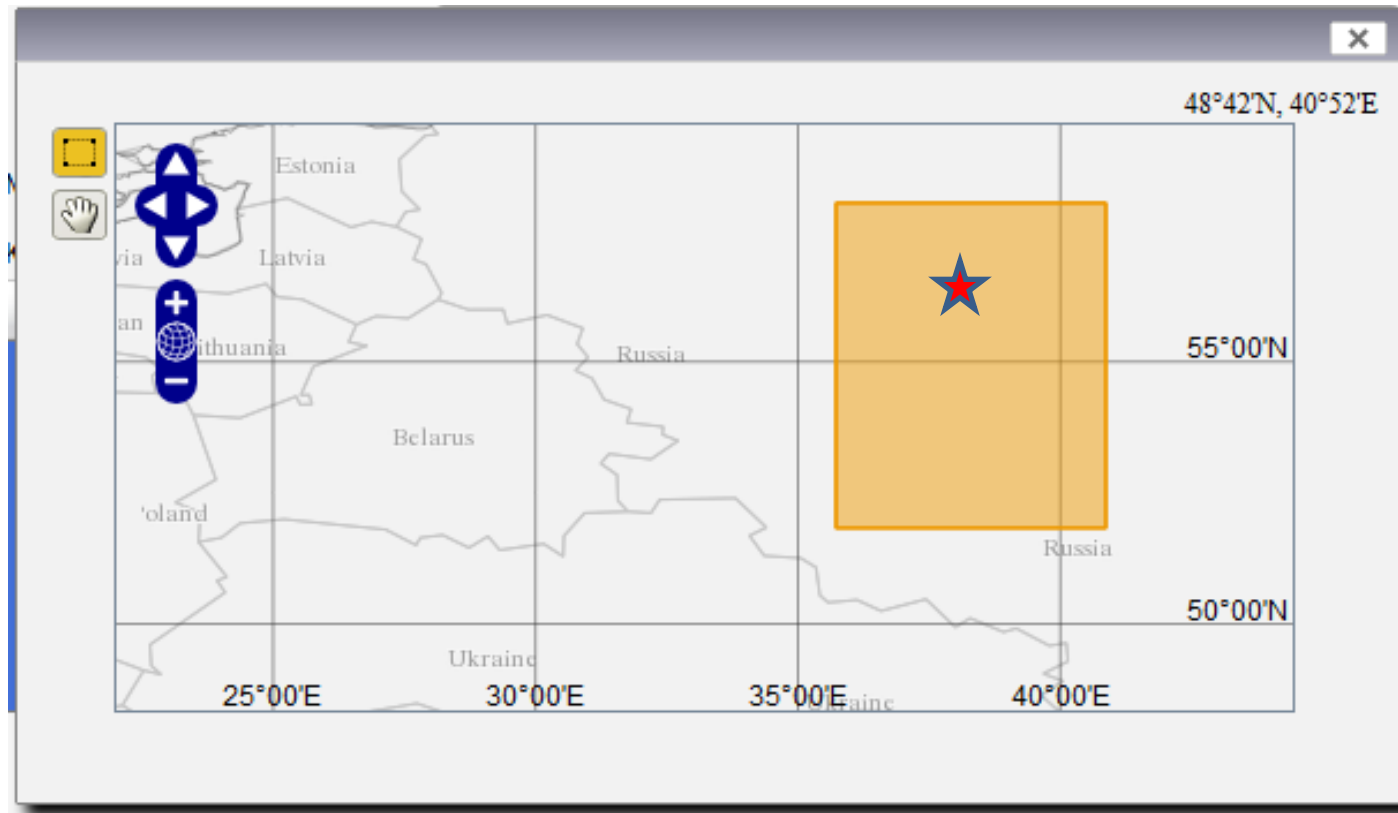
Area-averaged time-series is selected

The date range is selected

The region is selected (see next slide)

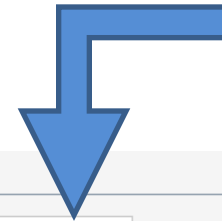
For this demonstration, a region of Russia including the city of Moscow was chosen. During the selected date range, the region was influenced by smoke and aerosols from large wildfires nearby, which began burning in late July.

The red star indicates the approximate location of Moscow. The light orange rectangle is the selected region.



Here is the results page for the time-series plots. Time-series have been plotted for all four of the selected data variables: MODIS-Terra and MODIS-Aqua Dark Target AOD, and AIRS total column ozone, daytime and nighttime.

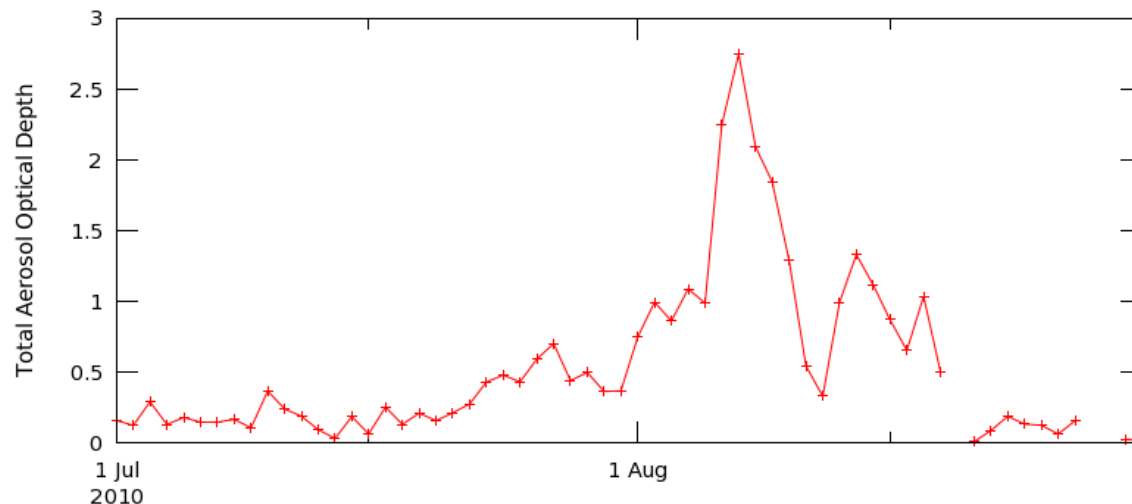
Click here to download the image



2. [Time Series, Area-Averaged](#)

 Image

Time Series, Area-Averaged of Aerosol Optical Depth 550 nm (Dark Target)
daily 1 deg. [MODIS-Terra MOD08_D3 v051] over 2010-07-01 - 2010-08-31,
Region 35.7275E, 51.8276N, 40.8691E, 58.0239N



History

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Scroll down to see
all four plots

[Acknowledgment Policy](#)

Help

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PLOT OPTIONS – the Y-axis of each plot can be scaled. The default Y-axis range depends on the range of output values for the data variable that is plotted.

2. [Time Series, Area-Averaged](#)

Minimum: 0.00806240923 Maximum: 2.74852275848
Area-Averaged of Aerosol Optical Depth 550 nm (Dark Target) daily 1:
Minimum: 279.428619385 Maximum: 346.67956543
Area-Averaged of Ozone Total Column (Nighttime/Descending) daily 1 deg. [AIRS]:
Minimum: 0.01677798725 Maximum: 2.60338328823
Area-Averaged of Aerosol Optical Depth 550 nm (Dark Target) daily 1:
Minimum: 296.716033936 Maximum: 373.849975586
Area-Averaged of Ozone Total Column (Daytime/Ascending) daily 1 deg. [AIRS]:

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To allow direct comparison of the time-series plots, the minimum and maximum Y-axis values were adjusted to be the same for the AOD series and the ozone series.

2. [Time Series, Area-Averaged](#)

Minimum: 0.008 Maximum: 2.8
Area-Averaged of Aerosol Optical Depth 550 nm (Dark Target) daily 1:
Minimum: 279.0 Maximum: 375.0
Area-Averaged of Ozone Total Column (Nighttime/Descending) daily 1 deg. [AIRS]:
Minimum: 0.008 Maximum: 2.8
Area-Averaged of Aerosol Optical Depth 550 nm (Dark Target) daily 1:
Minimum: 279.0 Maximum: 375.0
Area-Averaged of Ozone Total Column (Daytime/Ascending) daily 1 deg. [AIRS]:

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AOD min: 0.008
AOD max: 2.8

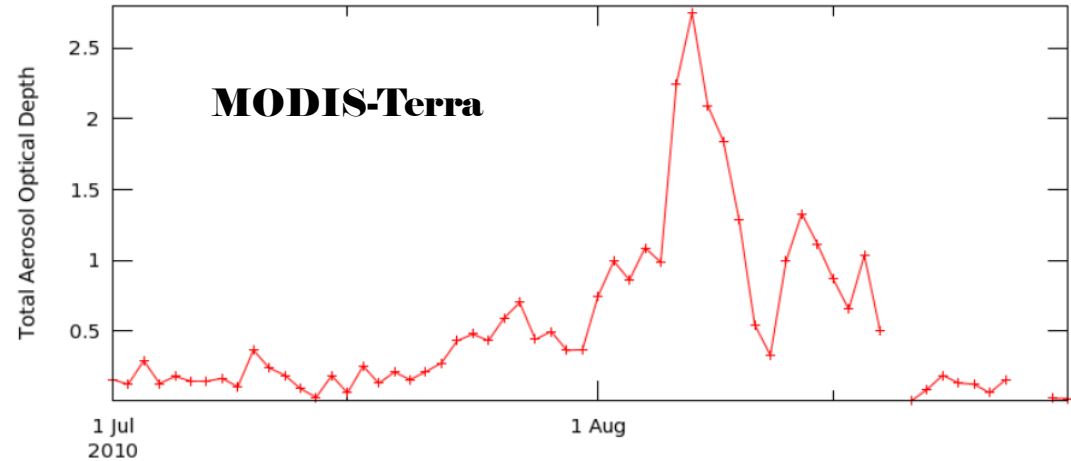
Ozone min: 279.0
Ozone max: 375.0

Then click
'Re-plot'

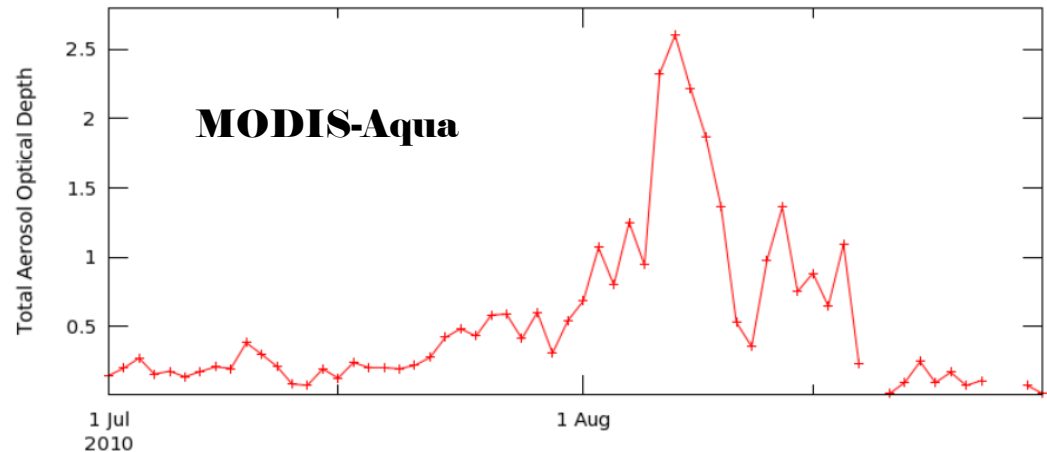
Here are the AOD time-series plots, with the same Y-axis range.

Aerosols from the wildfires began to affect the Moscow region in early August, several days after the fires began burning.

Time Series, Area-Averaged of Aerosol Optical Depth 550 nm (Dark Target)
daily 1 deg. [MODIS-Terra MOD08_D3 v051] over 2010-07-01 - 2010-08-31,
Region 35.7275E, 51.8276N, 40.8691E, 58.0239N



Time Series, Area-Averaged of Aerosol Optical Depth 550 nm (Dark Target)
daily 1 deg. [MODIS-Aqua MYD08_D3 v051] over 2010-07-01 - 2010-08-31, Region
35.7275E, 51.8276N, 40.8691E, 58.0239N

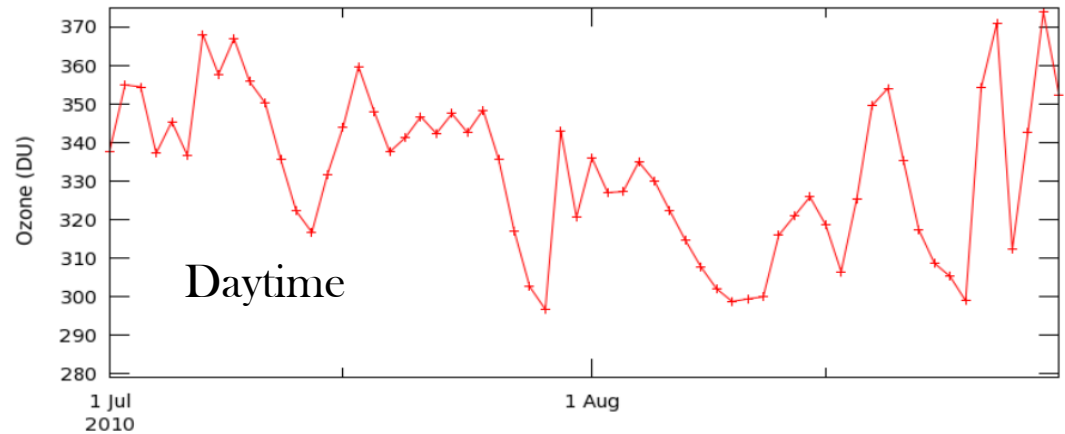


Here are the ozone time-series plots, with the same Y-axis range.

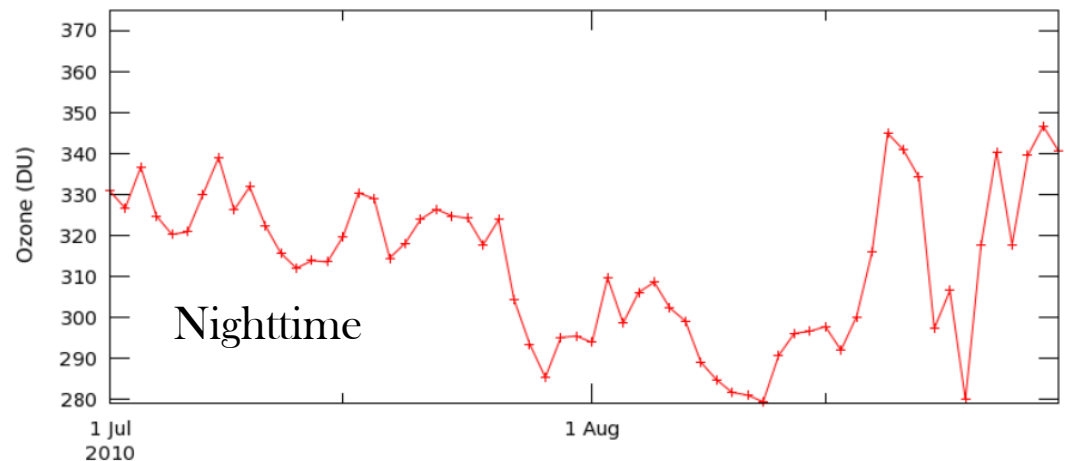
Ozone values peaked later in the month than the AOD values, especially at night.

Daytime values may be more affected by urban pollutants and photo-oxidation by sunlight in the summer.

Time Series, Area-Averaged of Ozone Total Column (Daytime/Ascending) daily 1 deg. [AIRS AIRX3STD v006] DU over 2010-07-01 - 2010-08-31, Region 35.7275E, 51.8276N, 40.8691E, 58.0239N



Time Series, Area-Averaged of Ozone Total Column (Nighttime/Descending) daily 1 deg. [AIRS AIRX3STD v006] DU over 2010-07-01 - 2010-08-31, Region 35.7275E, 51.8276N, 40.8691E, 58.0239N



DOWNLOAD OPTIONS – The data can be downloaded in the form of a PNG image from the results page (as shown earlier), or from the Downloads page (below).

The numerical values for the time-series can be downloaded in ASCII text format as CSV (Comma-Separated Values), which can be opened directly in Microsoft Excel or saved as a file.

2. [Time Series, Area-Averaged](#)

Click on file links to download. Files contain data portrayed in the plot images.

ASCII CSV:

[areaAvgTimeSeries.MOD08_D3_051_Optical_Depth_Land_And_Ocean_Mean.20100701-20100831.35E_51N_40E_58N.csv](#)
[areaAvgTimeSeries.AIRX3STD_006_TotO3_D.20100701-20100831.35E_51N_40E_58N.csv](#)
[areaAvgTimeSeries.MYD08_D3_051_Optical_Depth_Land_And_Ocean_Mean.20100701-20100831.35E_51N_40E_58N.csv](#)
[areaAvgTimeSeries.AIRX3STD_006_TotO3_A.20100701-20100831.35E_51N_40E_58N.csv](#)

ASCII text

Images (PNG):

[areaAvgTimeSeries.MOD08_D3_051_Optical_Depth_Land_And_Ocean_Mean.20100701-20100831.35E_51N_40E_58N.png](#)
[areaAvgTimeSeries.AIRX3STD_006_TotO3_D.20100701-20100831.35E_51N_40E_58N.png](#)
[areaAvgTimeSeries.MYD08_D3_051_Optical_Depth_Land_And_Ocean_Mean.20100701-20100831.35E_51N_40E_58N.png](#)
[areaAvgTimeSeries.AIRX3STD_006_TotO3_A.20100701-20100831.35E_51N_40E_58N.png](#)

PNG images

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Currently, multiple data variables cannot be plotted on the same plot. This is an option that will be released in a later version of Giovanni-4.

**End
of
demonstration**